

GP-302183

## FUEL CELL SYSTEM WITH RECUPERATIVE HEAT EXCHANGER

## ABSTRACT OF THE DISCLOSURE

A fuel cell system that employs a recuperative heat exchanger to provide additional cooling for the compressed charge air applied to the cathodes of the fuel cells in the fuel cell stack. The cathode exhaust gas is applied to the recuperative heat exchanger so that the cathode exhaust gas cools the charge air heated by the compressed air. A cathode exhaust gas expander is provided in combination with the recuperative heat exchanger that uses the energy in the heated cathode exhaust gas to power the charge air compressor. An anode exhaust gas combustor can be provided that burns residual hydrogen in the anode exhaust gas to further heat the cathode exhaust gas before it is applied to the expander.